

# Cell wall disassembly during on-tree maturation, ripening and senescence of 'Snow Queen' nectarines

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## Abstract

In order to monitor ripening-related cell wall modifications, samples of the 'Snow Queen' nectarine cultivar were picked periodically around the commercial harvest date. Yields of insoluble cell wall materials (CWM) in the flesh tissue decreased significantly during the sampling period in parallel to increased yields of the soluble fraction, indicative of a progressive depolymerisation and solubilisation of the cell wall components. Further fractionation of the CWM showed a strong correlation between flesh firmness and the content of covalently-bound pectins, which thus appeared a key factor determining this quality attribute in 'Snow Queen' nectarines. Although to a lesser extent, the content of matrix glycans was also well related to preservation of flesh firmness. In contrast, no softening-related changes were observed for pectins bound non-covalently to the cell wall, suggesting a minor role for these polymers in the softening process of this nectarine cultivar. Cell-wall-modifying enzyme activities considered herein (polygalacturonase, pectate lyase and endo-(1-4)- $\beta$ -D-glucanase) were generally higher at earlier picking dates and decreased as softening was taking place. These activities alone were not able to explain the modifications observed in flesh softening and cell wall composition, thus suggesting the synergistic action of a number of enzymes in the ripening-related softening of 'Snow Queen' nectarines.